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LOGISTICS MANAGEMENT INST WASHINGTON DC
L J BRAGG ET AL. 04 NOV 82 LMI-DC201

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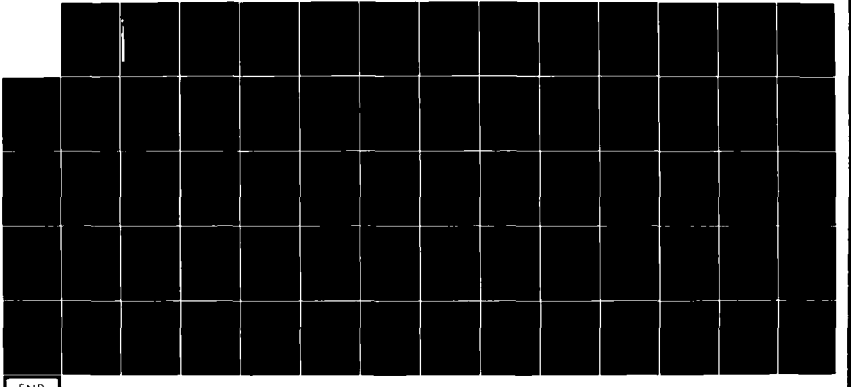

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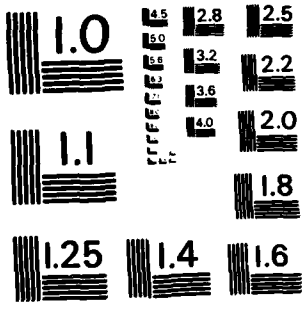

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ILS MANAGEMENT AT DCA

LUCAS J. BRAGG
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4 NOVEMBER 1982
TASK: DC201

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PREFACE

At the request of the Commander, DCA, we undertook an assessment of logistic support management in the Defense Communications Agency. Our assessment was one part of DCA's overall assessment of planning and system integration activities. The purpose of our task has been to devise a framework for implementation of ILS management at DCA.

During the course of this task, we reviewed DoD and DCA ILS and system acquisition policy, interviewed more than 20 senior DCA personnel, and developed a framework for ILS management in DCA. The framework (1) considers ILS in the acquisition of all defense-wide C^3 systems, and (2) emphasizes supportability in the earliest phases of system acquisition. We briefed our assessment results, findings, and recommendations to DCA ILS personnel and have documented them in this report, which includes our advice on establishing ILS policy and suggests a method for ILS implementation at DCA consistent with the DoD system acquisition policy.

In conducting our assessment of ILS at DCA, we found that DCA's role in ILS management is not defined. The Services are the prime equipment developers and users, and they control almost all acquisition funds. Not surprisingly, then, DCA is not staffed to support any major ILS development. Yet, we believe that DCA must consider supportability and ILS early in system acquisition--during the architectural and conceptual stages--to assure development of supportable Defense-wide C^3 systems.

TASK PURPOSE

The purpose of this task has been to assess logistic support management in the Defense Communications Agency. The report documents our advice on establishing integrated logistic support (ILS) policy within DCA and suggests a method for ILS implementation consistent with the DoD system acquisition framework. The suggested methodology is contained in Appendix A. It is equally applicable to both major and less-than-major systems and places strong emphasis on supportability in the earliest phases of system acquisition.

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DCA ILS PROGRAM AUTHORITY

- DoDD 5105.19
- DoDD 5000.1
- DoDI 5000.2
- DoDD 5000.39

DCA ILS PROGRAM AUTHORITY

The authority for conducting ILS activities in DCA lies primarily in three DoD Directives (DoDD) and one DoD Instruction (DoDI). DoDD 5105.19 provides the charter of DCA. DoDD 5000.1 and DoDI 5000.2 establish policy and procedures for DoD system acquisition. DoDD 5000.39 establishes policy and responsibilities for ILS. The framework for conducting ILS at DCA is primarily based on these directives and this instruction. It is important to note that:

- DoDD 5000.1 was revised early in 1982; a major point of the revision is to strengthen supportability as an equal consideration in the acquisition process. DoDI 5000.2 is currently being revised to provide overall procedural implementation for all system acquisition; DoDD 5000.39 also is being revised to reflect the additional emphasis to supportability early in acquisition planning.

- In DCA, DoDD 5105.19 provides specific guidelines for conducting ILS consistent with DCA's mission to provide system engineering and technical support over the life cycle of Defense-wide command, control and communication systems needed for national defense.

Details of DCA's ILS program authority are contained in Appendix B.

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PROBLEM ASSESSMENT

- DCA's ROLE IN ILS MANAGEMENT IS UNDEFINED
- THE SERVICES ARE THE PRIME EQUIPMENT DEVELOPERS AND USERS
- DCA CONTROLS VERY LITTLE ACQUISITION FUNDS
- DCA IS NOT STAFFED TO SUPPORT ANY MAJOR ILS INVOLVEMENT

PROBLEM ASSESSMENT

In conducting our assessment of ILS management in DCA, we noted four key factors.

The current ILS management role is not defined. For example, details of the realignment of ILS functions consistent with the 1981 DCA reorganization do not exist. Also, DCA internal guidelines are not adequately updated to reflect current DoD ILS policy.

DCA frequently operates in a hands-off manner as the Services are the equipment developers and operators. Additionally, DCA controls limited acquisition funds.

Finally, DCA does not appear to have adequate staff to support major ILS involvement, either at early, high-leverage points in program development, or at the later phases of acquisition where oversight of Service efforts may be appropriate.

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MAJOR FINDINGS

- TASKING IS OFTEN VERY BROAD AND FROM A VARIETY OF SOURCES
  - JCS
  - INTERNAL
  - MILDEP (UPGRADE)
  - ASD C^3I
  - UNIFIED AND SPECIFIED (E.G., $TNFC^3$ & RDJTF)
- TASKING DOES NOT USUALLY INCLUDE LOGISTICS CONSIDERATIONS, EXCEPT FOR AVAILABILITY REQUIREMENTS
- DCA ENGINEERING PERSONNEL, INCLUDING PSI, CCTC, AND DCEC, DO NOT CONSIDER SYSTEM SUPPORTABILITY AS THEIR RESPONSIBILITY
- MAJOR DRIVERS ARE:
  - BEST COMMERCIAL PRACTICE
  - RAPID ACQUISITION
- SENSITIVITY TO SUPPORTABILITY OCCURS WHEN OPERATIONAL UTILITY OF PROGRAM IS IMPACTED
- DCA RELIES ON MILDEPs/CINCs TO SUPPORT LOGISTICS REQUIREMENTS

MAJOR FINDINGS

What we have found at DCA regarding ILS can be summed up as follows: DCA must respond to a wide variety of taskmasters who look to DCA to rapidly respond to provide needed C^3 capabilities immediately. Supportability is a "weak sister," and, generally, DCA has to rely on others to assure that logistic requirements are met.

Tasking, which originates from both within DCA and without, does not usually include logistics considerations (except for availability requirements). Neither PSI, CCTC or DCEC provides system supportability with a high enough priority to receive adequate resources.

DCA's acquisition strategy is to minimize development and rely on "best commercial practices." Supportability surfaces only when operational utility problems arise, most often after the system is fielded. Early attention to ILS during the acquisition of both major and less-than-major systems is essential if DCA is to provide a sufficient emphasis on supportability.

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ILS MANAGEMENT MUST CONSIDER DCA UNIQUE ACQUISITION STRATEGY

- MISSION ANALYSIS AND LONG-RANGE PLANNING REQUIREMENTS
- ARCHITECTURE PHASE NOT ALIGNED TO DoD ILS POLICY
- TECHNOLOGY DEMONSTRATION BY DCA MAY BECOME MILDEP's BRASSBOARD OR NEAR FINAL DESIGN
- MILDEP CONTROLS MOST OF THE FULL-SCALE DEVELOPMENT, PROCUREMENT AND OPERATION OF A SYSTEM

ILS MANAGEMENT MUST CONSIDER DCA UNIQUE ACQUISITION STRATEGY

Mission analysis and long-range planning are a first step in acquisition. However, each actually continues throughout the acquisition process. Logistics analysis and long-range planning are closely coupled with mission analysis providing the foundation for sound long-range plans.

The early phase of acquisition includes architecture and technology demonstration. Neither of these are addressed in detail in DoD policy. ILS policy must be tailored to meet the unusual considerations imposed by DCA's uniqueness in acquisition of both major and less-than-major C^3 systems.

The partnership between the MILDEPs and DCA is undefined when it comes to logistics. At one extreme, DCA has purview over all phases of a system's life cycle, while at the other extreme, DCA has very little control over the execution of ILS and little direct control on system operation.

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AVAILABLE ILS MANAGEMENT TOOLS

DCA

- TECHNICAL ANALYSIS AND COST ESTIMATE (TA/CE)
- LIFE CYCLE COST MODELS
- MANAGEMENT ENGINEERING PLANS
- ARCHITECTURE DESCRIPTIONS

DoD

- LIFE CYCLE COST MODELS
- INTEGRATED LOGISTIC SUPPORT PLANS
- MISSION AREA LOGISTICS ANALYSIS

AVAILABLE ILS MANAGEMENT TOOLS

ILS management tools are available at DCA as well as at the DoD level. These tools are to be strengthened under current acquisition and supportability policy.

Within DCA, four primary ILS management tools are available. Technical Analysis Cost Estimate (TA/CE), which is defined in detail in Appendix E of the JCS Memo SM-7-82, provides the foundation for validation of a requirement and approval of the implementation proposal. It includes technical factors feasibility analysis; alternatives; the recommended alternative, including project engineering and implementation concept; and a five-year cost and manpower estimate, including R&D, procurement, construction, and O&M costs. The TA/CE is key to providing ILS visibility at the very beginning of the program.

Other DCA tools include life cycle cost models (LCCM), management engineering plans (MEP) and architecture descriptions. LCCM incorporate supportability in determining program costs over the full life cycle. The MEPs provide control of program implementation by all participating organizations while identifying or specifying logistic support planning, integrated testing, training, and so on. Mission Area Logistics Analysis needs to be developed at DCA to provide longer range logistics planning and an integrated perspective of the supportability needs of C^3 systems acquisition.

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CONCLUSIONS

- LOGISTICS IS TOO LOW A PRIORITY TO BE A SIGNIFICANT "PLAYER" WITHIN CCTC, DCEC, DCSO AND PSI (ARCHITECTURE)
- DCA IS NOT STAFFED TO FULFILL CURRENT LOGISTICS ANALYSIS AND MANAGEMENT RESPONSIBILITIES. NEW DoD DIRECTION WILL INCREASE THOSE RESPONSIBILITIES
- AVAILABLE TOOLS ARE POORLY UTILIZED
  - LCC MODELS "RUBBER STAMP" ILS CONSIDERATIONS
  - TA/CE IS NOT SENSITIVE TO MANPOWER VARIABILITY
  - DCA PECULIAR REQUIREMENTS ARE NOT CONSIDERED
- ACQUISITION PLANNING DOES NOT CONSIDER SYSTEM SUPPORTABILITY

CONCLUSIONS

The four major conclusions based on our assessment are:

First, program personnel, especially engineering personnel, throughout DCA acknowledge the logistics function as one of their responsibilities; but they perceive other responsibilities as higher in priority, and they claim to lack sufficient resources to accomplish all their responsibilities.

Second, DCA does not have a sufficiently large complement of logistics analysts and managers to fulfill the increasingly greater responsibility to address readiness and supportability issues.

Third, the available tools are poorly utilized. LCC models lack the flexibility to deal with program tradeoffs and requirements/deficiencies at the early stage of the acquisition. The TA/CE does not reflect sensitivity to manpower resource. Tools do not reflect peculiar requirements of DCA's role in front-end planning and oversight.

Finally, an overall approach to addressing system supportability is lacking; and acquisition planning does not have an adequate supportability foundation in DCA.

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RECOMMENDATION #1

DEFINE PHASES OF THE ACQUISITION PROCESS
TO ALLOW DEVELOPMENT OF USEFUL ILS
STRATEGY IN DCA

RECOMMENDATION #1

ILS management in DCA, while conforming to the Department of Defense system acquisition process, must be tailored to DCA's peculiar role in C^3 acquisition and *modus operandi*. Accordingly, we recommend that DCA define phases of the acquisition process to allow development of useful ILS strategy for both major and less-than-major C^3 systems consistent with a DCA mission-oriented planning process.

Such a strategy would be based on a strong mission analysis, long-range planning and architectural perspective and on the nature of products to be developed and acquired by DCA and the MILDEPs to obtain needed Defense-wide C^3 capabilities. This strategy would provide the needed emphasis on supportability at the beginning of a program in the earliest phases of system acquisition. This strategy also allows DCA to conduct expanded supportability planning for JCS and OSD.

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RECOMMENDATION #2

DEVELOP A TAILORED APPROACH TO IMPLEMENT ILS, BASED UPON DCA'S PROGRAM ROLE

- "HANDS-OFF" FOR MILDEP INTERNAL UPDATE
- OVERSIGHT FOR DCA/MILDEP DEVELOPMENT
- ACTIVE PARTICIPATION FOR ARCHITECTURE PHASE; ANALYSIS
- ACTIVE ILS PLANNING FOR DEVELOPING SYSTEMS; ANALYSIS AND PREPARATION OF REQUIRED LOGISTICS ELEMENTS; I.E., DDN, GMCC, ETC.

RECOMMENDATION #2

Within the overall mission planning and acquisition process framework as described in Recommendation #1, we recommend that DCA tailor an ILS implementation approach reflecting the diversity of DCA programs. Accordingly, ILS should be tailored to the role DCA is playing in any particular acquisition program, either major or less-than-major.

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RECOMMENDATION #3

IMPROVE UTILIZATION OF CURRENTLY AVAILABLE ILS TOOLS

- LIFE CYCLE COST. PSI/ILS MANAGERS SHOULD ACQUIRE LCC MODELS TAILORED TO DCA'S ROLE IN THE ACQUISITION PROCESS AND ASSURE THEIR APPLICATION AND USE.
- TA/CE. PSI/ILS MANAGER SHOULD BE THE APPROVING AND REVIEWING AUTHORITY FOR LOGISTICS INPUTS.
- MANAGEMENT ENGINEERING PLAN. IN COORDINATION WITH MILDEPs, DCA PROGRAM MANAGERS SHOULD DEVELOP BETTER ILS AGREEMENTS AND PLANS, AND APPLY MEPs ON A CONTINUING BASIS.

RECOMMENDATION #3

Currently available tools need to be better utilized, especially on the early phases of system acquisition. In particular, we recommend improved utilization of life cycle cost models (LCCM), technical analysis and cost estimates (TA/CE) and management engineering plans (MEP) in both major and less-than-major system acquisitions.

LCCM should become the tools that DCA PSI and ILS managers use to incorporate operating and support cost considerations into system acquisitions.

TA/CE should have more logistics input based on contributions from DCA PSI and ILS managers.

The ILS portion of MEPs should be improved, with a focus on ILS agreements and plans between DCA and MILDEPs. MEPs should be a continuing oversight vehicle for use by DCA in working with the MILDEPs.

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RECOMMENDATION #4

DEVELOP NEW RAM ENGINEERING AND LOGISTICS TOOLS APPLICABLE FOR ARCHITECTURAL PHASE.

- PROVIDE GUIDELINES FOR ENGINEERING CENTERS AND PSI
- DEVELOP METHODS APPLICABLE FOR MISSION AREA AND CONCEPTUAL PHASE ANALYSIS
- DEVELOP A SERIES OF COST ESTIMATORS (CERs) FOR USE IN MODELING EFFORTS
- DEVELOP AN MIS DATA BASE TO SUPPORT ANALYSIS EFFORTS

RECOMMENDATION #4

Additional logistics analysis tools need to be developed, especially tools for use early in the acquisition process and specifically applicable to developing architectures. We recommend that:

- Guidelines for ILS analysis, tailored to the needs of DCA personnel in PSI and the engineering centers, be developed and disseminated.
- Supportability and logistics analysis methods be developed for the mission analysis and conceptual phases of the acquisition process.
- A series of cost estimating relationships (CERs) be developed to facilitate program analysis and program tradeoffs, especially in the early phases of system acquisition.
- Develop a management information system data base to support analysis efforts.

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APPENDIX A

SUGGESTED METHOD TO IMPLEMENT ILS AT DCA WITHIN DoD ACQUISITION FRAMEWORK

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SUGGESTED METHOD TO IMPLEMENT ILS AT DCA WITHIN DoD ACQUISITION FRAMEWORK

- DoDD 5000.1, ET AL, PRIMARY DRIVER
- COMPATIBILITY WITH JCS MEMO SM-7-82

SUGGESTED METHOD TO IMPLEMENT ILS AT DCA WITHIN DoD ACQUISITION FRAMEWORK

SUGGESTED METHOD

The following charts illustrate a method for implementing ILS consistent with the framework for defense system acquisition as outlined in DoD Directive 5000.1, Major System Acquisition. The method is applicable to both major and less-than-major system acquisition programs.

Each phase of the acquisition process is shown, major DCA acquisition activities are listed, and logistics considerations, including ILS and supportability, are tabulated.

The early phases of the acquisition process (mission analysis and concept exploration) require extraordinary attention by DCA planners, managers and engineers. It is at that time that decisions are made that have significant downstream impact, especially with regard to life cycle cost and overall operations and support costs within a mission area.

Appendix C describes mission analysis in greater detail.

JCS Memorandum SM-7-82 of 11 January 1982 provides a consolidated statement of policy and procedures for management of joint command and control systems. Implementation of acquisition and supportability activities should be undertaken consistent with these policies and procedures as well as DoDD 5000.1 and DoDD 5000.39.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
CONTINUOUS MISSION ANALYSIS	- CONDUCT ANALYSIS OF MISSION AREAS - DEVELOP MISSION NEEDS/REQUIRED, OPERATIONAL CAPABILITIES, INCLUDING *TECHNICAL ANALYSIS/COST ESTIMATE* (TA/CE) - PLAN FOR PROGRAM APPORVAL - PREPARE JMSNS OR EQUIVALENT - DEMONSTRATE NEW TECHNOLOGY	- OPERATIONAL SUITABILITY OF CURRENT SYSTEMS - READINESS AND SUSTAINABILITY BY MISSION AREA FOR NEEDS AND OPPORTUNITIES - AFFORDABILITY ASSESSED FROM OWNER-SHIP COST PERSPECTIVE (INCLUDING LIFE CYCLE COST) - MAJOR SUPPORT CONSTRAINTS ON MISSION ACCOMPLISHMENT (E.G., MANPOWER, ETC.)
LONG-RANGE PLANNING	- DEVELOP STRATEGIC PLANS - EVOLVE C^3 ARCHITECTURE	

CONTINUOUS MISSION ANALYSIS/LONG-RANGE PLANNING

Mission analysis and long-range planning are a first step in acquisition. However, each actually continues throughout the acquisition process. Logistics analysis and long-range planning are closely coupled with mission analysis providing the foundation for sound long-range plans.

Mission Analysis

Mission analysis provides a rationale for new initiatives in terms of needs viewed in the context of DoD mission areas. Requirements must be validated and transformed into needs that are affordable and consistent with defense-wide C^3 architecture. Validated requirements are incorporated into the POM along with a Justification for Major System New Start, or equivalent justification statements for less than major systems.

Long-Range Planning

Strategic planning for C^3 focuses on evolving the architecture to allow for execution of tasks supported by command and control systems. Planning and architecture definition are key steps in providing a framework for justifying both new acquisitions and technology demonstrations.

Logistics Considerations

A new and significant acquisition policy initiative, elevating readiness and sustainability as primary objectives of the acquisition process, places greater importance on the ILS and supportability functions. Operational suitability, including all supportability aspects, is now an objective of equal importance with operational effectiveness.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
[MILESTONE 0 INCORPORATED AS PART OF PPBS]	- DEVELOP MISSION NEED DETERMINATION VIA JMSNS OR EQUIVALENT (E.G., ROC) - SUBMIT POM - PROGRAM INITIATION DECISION - DEVELOP GUIDANCE TO PROCEED VIA PDM	LOGISTICS CONSIDERATIONS IDENTIFIED: - EXCESSIVE MANPOWER - LOGISTIC SUPPORT REQUIREMENTS UNSATISFIED - OWNERSHIP COSTS - INADEQUATE SYSTEM READINESS - LOGISTICAL TECHNOLOGICAL OPPORTUNITY
CONCEPT EXPLORATION	- ASSIGN PM - DEVELOP ACQUISITION STRATEGY - CONDUCT LOGISTIC SUPPORT ANALYSIS (LSA) - ESTABLISH SYSTEM READINESS OBJECTIVES - COMPLETE PRELIMINARY EVALUATION (CONCEPTS, COST, SCHEDULE, READINESS OBJ., AFFORDABILITY - DEVELOP "LEVEL A" SPEC (SYSTEM SPEC)	- LOGISTICS SUPPORTABILITY/OPERATIONAL SUITABILITY - ALTERNATIVES IDENTIFIED, ESPECIALLY TO REDUCE SUPPORT RISK - CURRENT SYSTEM DRIVERS IDENTIFIED; IMPROVEMENTS DECIDED ON - SUPPORTABILITY PARAMETERS (GOALS AND THRESHOLDS) - SYSTEM READINESS THRESHOLDS - EQUIPMENT AND ARCHITECTURAL STANDARDIZATIONS, GOALS AND OBJECTIVES - INDUSTRIAL BASE RESPONSIVENESS - SAFETY, ENERGY EFFICIENCY AND SURVIVABILITY/ENDURANCE, WHEN APPLICABLE

MILESTONE 0 AND CONCEPT EXPLORATION

The initiation of an acquisition program is marked by an agreement and acceptance of a need within a mission area and the programming of resources to meet that need. In a standard acquisition program, the exploration of alternative concepts follows into the next phase. An emphasis on operational suitability is now explicitly required at the inception of an acquisition program.

Milestone 0

Milestone 0, or mission need determination, has been incorporated into the planning, programming and budgeting system (PPBS). Mission need determination is accomplished in the PPBS process based on submission of Justification of Major System New Starts (JMSNS) submitted with the Program Objectives Memorandum (POM). Secretary of Defense provides approval via program guidance in the Program Decision Memorandum (PDM).

Concept Exploration

This phase serves to explore and narrow down concepts, under the guidance of a chartered program manager (PM). These concepts have been identified to satisfy the need while also providing for further validation of the requirement identified at Milestone 0. It is the first of two formal SECDEF major decision milestones. Effort in this phase focus on developing a system-level specification (or "Level A" Spec) and allows preparation of Milestone I documentation, particularly the System Concept Paper as well as a Test and Evaluation Master Plan and a Cost and Operational Effectiveness Analysis.

Logistics Consideration

Logistics considerations at Milestone 0 focus on identifying deficiencies or opportunities in operational suitability of current and planned capabilities in a mission area. Such deficiencies may be found in manpower, logistic support, ownership cost, system readiness, as well as exploitable technological opportunities.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
MILESTONE I [OPTIONAL IF NO DEM/VAL REQUIRED]	- VALIDATE REQUIREMENTS PER SCP - CONSIDER ALTERNATE SYSTEMS - PREPARE SUPPORT THRESHOLDS AND OBJECTIVES	- LOGISTICS SUPPORTABILITY - ESTABLISH READINESS THRESHOLDS AND OBJECTIVES (PROJECTED/ACTUAL)
DEMONSTRATION AND VALIDATION	- SELECT BEST ALTERNATIVE - DEVELOP EXPEPIMENTAL PROTOTYPE - FINALIZE OPERATIONAL CONCEPT - EVALUATE PROPOSALS - REFINE LOGISTIC SUPPORT ANALYSIS - PREPARE DCP AND IPS - DEVELOP "LEVEL B" SPEC (DEVELOPMENT SPEC)	- SYSTEM READINESS OBJECTIVES - ALTERNATIVE SYSTEM ANALYZED FOR SUPPORTABILITY/OPERATIONAL SUITABILITY - R&M, SUPPORT AND PERSONNEL - FACILITIES, MANUFACTURING AND PRODUCTION, SAFETY/ENVIRONMENT/ HEALTH AS REQUIRED

MILESTONE I AND DEMONSTRATION AND VALIDATION

Following validation of the requirement and agreement as to the system concepts documented in the System Concept Paper, a demonstration/validation phase of acquisition follows, tailored to minimize acquisition time and cost consistent with the need and technical risk. If a discrete demonstration and validation phase is not required, a review of the acquisition strategy may be substituted for a formal Milestone I review.

Milestone I

The validation of the requirement is based upon preliminary evaluation of concepts, costs, schedule, readiness objectives, and affordability. The acquisition strategy is reviewed for acquisition of the basic system, pre-planned product improvements and post-production support. Overall support thresholds and objectives are approved. Milestone I requirements include a baseline Logistic Support Analysis (LSA), improvement targets, tentative readiness and R&M objectives, new manpower skills and training requirements, the preliminary operational and support concept, and R&D funds for logistic tradeoffs.

Demonstration and Validation Phase

During demonstration and validation, the objective is to select the preferred alternative. Full-Scale Development is not accomplished in this phase; however, prototypes may be developed to provide demonstration in an operational environment. A "Level B" development specification is prepared along with required documentation for Milestone II, the Decision Coordinating Paper (DCP) and Integrated Program Summary (IPS).

Logistics Considerations

The concepts for achieving logistics supportability are reviewed at Milestone I, and thresholds and objectives for readiness are established. During demonstration and validation, system readiness objectives are analyzed, and alternative systems are evaluated for supportability and operational suitability, specifically addressing R&M, support and personnel factors.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
MILESTONE II • AT FSD ENTRY • DELAYED	- APPROVAL BY SECDEF - REVIEW TRADEOFF BETWEEN COST, *PERFORMANCE, SCHEDULE AND LOGISTICS* - REFINE LCC/DTUC - DEFINE SUPPORTABILITY, PRODUCIBILITY INDUSTRIAL BASE RESPONSIVENESS, TESTING - ESTABLISH THRESHOLDS FOR MILESTONE III DELEGATION	- MANPOWER GOALS AND THRESHOLDS - SUPPORTABILITY REQUIREMENTS - R&M GOALS - READINESS OBJECTIVES (PROJECTED/ ACTUAL)

MILESTONE II

Milestone II marks the decision to go-ahead with the program, including production and deployment, and to proceed into full-scale development, if full-scale development is required beyond Milestone II for the acquisition reviewed. Cost/performance/schedule/logistics tradeoffs are reviewed to establish thresholds for manpower, supportability and R&M for further milestones. The timing of Milestone II is flexible and depends upon the tailored acquisition strategy approved at Milestone I. Design competition is normally maintained up to this point.

Traditional Milestone II

In a traditional approach, Milestone II occurs when a program moves from demonstration and validation into full-scale development. It may be desirable to delay this decision until some additional development (including early full-scale development) has been accomplished to provide better definition of performance, cost, schedule, *producibility, industrial base responsiveness*, supportability and testing.

Delayed Milestone II

A delayed Milestone II may involve full-scale development; if so, full scale development contracts will be written to allow termination at least cost to the Government.

Summary of Milestone II Logistics Considerations

Supportability requirements at Milestone II include readiness guidelines, R&M goals and thresholds, test plans, support concept, preliminary manpower requirements, ILS phasing plans, and projected logistic resource requirements and schedule.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
FULL-SCALE DEVELOPMENT	- PREPARE DETAILED LOGISTIC SUPPORT ANALYSIS - VALIDATE LCC/DTUC - DEVELOP ITEMS FOR OPERATIONAL TEST AND EVALUATION - PREPARE FIRM COST PROPOSALS FOR PRODUCTION - DEVELOP "LEVEL C/D/E" SPECS (PRODUCTION/PROCESS/MATERIAL SPECS)	- LSA PROGRAM CONTINUATION - DETAILED LOGISTICS PLANNING - ILS WEIGHT ON PROPOSALS - LOGISTICS RISKS IDENTIFIED AND ADDRESSED - MANPOWER ESTIMATES REFINED - MAINTENANCE CONCEPT CONFIRMED - ESTABLISH SET OF SUPPORT, BIT, R&M GOALS; COMPARE TO BASELINE SYSTEM - T&E PLAN IMPLEMENTATION

FULL-SCALE DEVELOPMENT

This phase follows demonstration and validation of alternative systems when those systems selected for further consideration in the acquisition process have not been fully developed. This phase is also critical for developing firm production requirements and capabilities. After a Milestone II go-ahead, this phase provides for continued development, with production and deployment to follow. Limited production for OT&E and long-lead procurement items is feasible.

Full-Scale Development Activities

The principal activity is to develop full-scale systems for final test and evaluation prior to production. As part of the full-scale development, detailed logistic support analyses are undertaken to complete the development of the logistic support system. Cost estimates are validated based on full-scale design implementation, including life cycle and design-to-unit cost. Firm cost proposals based on contractor-developed specifications for production, processes, and materials are obtained and evaluated.

Logistic Considerations

Implementation of the ILS program is undertaken based on detailed logistics planning. Logistics risks, manpower estimates and the maintenance concept are further detailed. Support, testability, reliability and maintainability (R&M) goals for production are set and compared with the original baseline. Test and evaluation of supportability is accomplished.

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PROGRAM PHASE/DECISION (DoD)	ACTIVITY (DCA)	LOGISTICS CONSIDERATION (ILS)
MILESTONE III [DELEGATED TO COMPONENTS UNLESS THRESHOLDS BREACHED]	- MONITOR SUPPORTABILITY OF INITIAL OPERATIONAL UNITS - REVIEW OPERATIONAL R&M - REVIEW AND TRAINING REQUIREMENTS	- MANPOWER & TRAINING REQUIREMENTS - ACHIEVEMENT OF READINESS OBJECTIVES (PROJECTED/ACTUAL)
PRODUCTION DEPLOYMENT DECISION		
PRODUCTION AND DEPLOYMENT	- COMBINE WITH FOLLOW-ON OT&E - MONITOR PRODUCTION, PROCUREMENT AND LOGISTICS SUPPORT	- MAINTENANCE AND TRAINING - LOGISTICS SUPPORT - MAINTENANCE PLAN

MILESTONE III AND PRODUCTION AND DEPLOYMENT

Milestone III marks the decision to produce and deploy the system. If thresholds are not breached, the DoD component can provide go-ahead to proceed, consistent with the acquisition strategy and goals and thresholds established at Milestone II without a formal DSARC review. Milestone III approval is delegated to the Services and can be further redelegated to a lower level within the Services that still has adequate overall program oversight.

Milestone III

Milestone III supportability requirements include: R&M test results, R&M improvement plans and funding, adjusted resource (FYDP) plans to meet readiness objectives, adjusted manning document, ILS completion schedule and resources, and follow-on evaluation plans. If these results are satisfactory, and the program has demonstrated readiness for production, production and deployment will be approved.

Production and Deployment

This phase is oriented to achieving production of authorized quantities on schedule and within budget and achieving a high level of operational readiness for the deployed systems. Activities include system manufacturing, quality assurance/acceptance testing, configuration management, personnel training and operation and maintenance. Appropriate follow-on operational test and evaluation is a primary DCA concern.

Logistics Considerations

Maintenance and training must be implemented. The logistics support system must provide adequate supply/spares support. Overhaul, operations and repair is done consistent with maintenance plans.

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APPENDIX B

DCA ILS PROGRAM AUTHORITY

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DoD DIRECTIVES AND INSTRUCTIONS

The authority for conducting Integrated Logistic Support (ILS) activities in DCA lies primarily in three DoD Directives (DoDD) and one DoD Instruction (DoDI). DoDD 5105.19 provides the charter of DCA. DoDD 5000.1 and DoDI 5000.2 establish policy and procedures for Major System Acquisition. DoDD 5000.39 establishes policy and responsibilities for ILS. The framework for conducting ILS at DCA is based on these directives and instruction.

DoDD 5105.19--DEFENSE COMMUNICATIONS AGENCY

This directive, reissued August 10, defines the mission, responsibilities, authorities and command relationships of DCA and the Director, DCA. In general, this directive established DCA as a DoD agency under the direction of the then Assistant Secretary of Defense (Communications, Command, Control and Intelligence (ASD(C^3I)) with guidance from the Joint Chiefs of Staff (JCS) regarding military and communications, doctrine and operational policies and procedures. DCA now operates under the direction of USDRE. Responsibility for ILS is found in the DCA mission to perform system engineering for the Defense Communications System; to conduct system engineering and technical support to the National Military Command System (NMCS), the Minimum Essential Emergency Control Network (MEECN), and the Worldwide Military Command and Control System (WWMCCS); and to carry out system architect functions for Military Satellite Communications (MILSATCOM) systems, while providing analytic and ADP support to the JCS and OSD and procuring leased communications where authorized or directed. ILS responsibilities span the entire life cycle and include: provide appropriate planning documents; develop and promulgate procedures; develop technical standards; perform subsystem/project engineering; perform centralized engineering and management (specifically of nontactical offbase DoD multiplex systems); and, especially, establish requirements for and recommend assignment of responsibilities for preparation and execution of logistic engineering and other support plans.

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DCA ILS PROGRAM AUTHORITY

- DoDD 5105.19
- DoDD 5000.1
- DoDI 5000.2
- DoDD 5000.39

DoDD 5000.1--MAJOR SYSTEM ACQUISITION

DoDD 5000.1, reissued March 29, 1982, by USDRE, provides an updated statement of acquisition policy for both major and less-than-major systems or major modifications to existing systems and implements the concepts and provisions of OMB Circular A-109, "Major Systems Acquisitions." The current version has been revised to reflect the principles and policies of the DoD Acquisition Improvement Program, including elevating readiness and sustainability as primary objectives of the acquisition process. It also establishes that a cost-effective balance of acquisition cost, ownership cost and system effectiveness be achieved. Operational suitability is defined, along with operational effectiveness, to establish a framework for analyzing mission areas. Determination of operational suitability includes whether a system can be placed satisfactorily in field use and considers availability, compatibility, transportability, interoperability, reliability, wartime usage rates, maintainability, safety, human factors, logistics and manpower support ability and training requirements. Readiness procedures, including developing goals and related design requirements, are established and logistic supportability is to be addressed early in the formulation and implementation of acquisition strategy. ILS implementation consistent with DoDD 5000.39 is directed. Logistics responsibilities consistent with the ASD(MRA&L) charter are defined, including those for supportability policy, planning, and monitoring/coordination.

Management principles and objectives in this Directive also apply to the acquisition of less-than-major systems (i.e., acquisition of defense systems not designated as major) and govern the acquisition of all DCA acquisition programs.

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DCA ILS PROGRAM AUTHORITY

- DoDD 5105.19
- DoDD 5000.1
- DoDI 5000.2
- DoDD 5000.39

DoDI 5000.2--MAJOR SYSTEM ACQUISITION PROCEDURES

DoDI 5000.2 currently being coordinated (coordination draft, April 9, 1982) will provide revised procedures for implementing DoDD 5000.1 and will supercede DoDI 5000.2 of March 19, 1980. The main issue in achieving coordination, according to USDRE memorandum of May 21, 1982, is "What is the kind and amount of information necessary to arrive at a reasonable decision?" given that the Secretary of Defense has acquisition decision-making responsibilities. Further revision to DoDI 5000.2 is in progress. In the interim program documentation format for major defense system acquisition programs has been prescribed via USDRE memorandum of April 12, 1982. These include formats for Justification for Major System New Starts (JMSNS), System Concept Paper (SCP), Decision Coordinating Paper (DCP), and Integrated Program Summary (IPS); each stipulated readiness, supportability, and logistics data to be included in the program documentation.

The DoDI 5000.2 coordination draft also includes several significant features bearing on the DCA ILS framework:

- The Defense Weapon Support Improvement Group (DWSIG), as part of the milestone review process, can advise the Defense Acquisition Executive on manpower and logistics activity.

- Logistics-oriented program reviews may be conducted in addition to formal milestone reviews.

- Management and design considerations that bear on ILS are tabulated. Management considerations include establishing goals and thresholds for readiness and supportability; the requirement for life cycle cost estimates at each program milestone; and specific guidelines on command and control (C^2) systems that stress tailoring acquisition strategies, using pre-planned product improvement (P^3I) when evaluation of a "core" system, achieving teamwork among developers, independent testers, logisticians and the user, and survival and endurability of major and non-major C^2 systems, counter-C^3, ECM and EW systems. Also, the operational concept includes development of a system readiness objective (by Milestone I and finalized by Milestone II); explicit design guidelines for system readiness, support and personnel (including training) to stress that readiness resources will receive the same emphasis as those required to achieve schedule or performance objectives; and consideration of reliability and maintainability, system safety, and energy and environment in design.

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DCA ILS PROGRAM AUTHORITY

- DoDD 5105.19
- DoDD 5000.1
- DoDI 5000.2
- DoDD 5000.39

DoDD 5000.39--ACQUISITION AND MANAGEMENT OF ILS FOR SYSTEMS AND EQUIPMENT

DoDD 5000.39 issued January 17, 1980 by ASD(MRA&L), establishes policy and responsibilities for ILS, including manpower planning, as an inherent part of system acquisitions. It applies to single component, multi-component and international acquisitions. It also directs that system readiness goals be met within established cost, schedule, performance, manpower and other logistic constraints. The policy provides general program management guidance that requires an ILS program beginning at Milestone 0, establishing realistic goals and thresholds for system readiness, support resources and support-related design parameters, and tailoring of the ILS program to the specific needs of the program. The policy also provides a basis for ILS planning and resource decisions, guidelines on Logistic Support Analysis (LSA) requirements, ILS management and test and evaluation (T&E). Staff support requirements for ILS, including reporting systems and data bases, research and study programs, career fields and career development, program and data requirements, and guidance for T&E, are also provided. The Director, DCA is required to:

a. Implement the policies of DoDD 5000.39 for system acquisition programs.

b. Develop policies for the application of ILS to less-than-major acquisitions.

c. Establish a DCA focal point for ILS policy.

d. Ensure that each major program has representation and participation of the functional elements responsible for the programming, funding, acquisition, and application of system support resources.

e. Include adequate development and production funding in budget submissions and identify the readiness impacts of funding shortfalls.

f. Conduct ILS reviews to assess, in quantitative terms, the adequacy of logistic plans, resources, and support-related parameters to meet system goals at each acquisition milestone.

DCA program managers and managers of C^3 programs under DCA oversight shall:

a. Include ILS as an integral part of their acquisition programs.

DoDD 5000.39 (Cont'd)

b. Allocate appropriate development and production resources and schedule for ILS, including ILS requirements of participating DoD Components in multi-component acquisiton programs.

c. Balance system readiness with cost, schedule, and performance goals.

d. Advise the Director, DCA and the Defense Acquisition Executive on projected shortfalls or impediments to meeting system readiness goals.

ILS is defined and support considerations in the system acquisition process are also tabulated.

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APPENDIX C

MISSION ANALYSIS

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MISSION ANALYSIS

- OVERVIEW OF MISSION ANALYSIS (MA)
- MISSION ANALYSIS ELEMENTS
- C^2 SYSTEM ACQUISITION AND MA
- DEVELOPMENTS IN MA UNDERSTANDING

MISSION ANALYSIS

This appendix documents developments in mission analysis as they impact DCA. Mission analysis elements are tabulated based primarily on the current DoDD 5000.1, the April 9, 1982, draft of DoDI 5000.2 and the USDRE Memorandum of May 21, 1982, describing acquisition program documentation. Further items bearing on mission analysis evolution are also highlighted. Specifically included are:

- an overview discussion of mission analysis, discussing planning interface, documentation, and perspective
- elements of mission analysis that must be accomplished
- specific aspects of C^2 system acquisition per DoDD 5000.1 and DoDI 5000.2
- developments in mission analysis that will bear on future execution.

As a key to a focus on a planning, DCA is required to conduct continuing analyses of the DCA mission areas (specifically C^3) to identify deficiencies or to determine more effective means of performing assigned tasks. From those mission analyses, a deficiency or opportunity may be identified that could lead to initiation of a system acquisition program.

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MISSION ANALYSIS - COUPLING OF ACQUISITION/SUPPORTABILITY TO PPBS

- PLANNING AND MISSION ANALYSIS INTERELATED
- MISSION ANALYSIS PRODUCES JMSNS
  - NEEDS BY MISSION AREA
  - REQUIREMENTS VALIDATED
  - ARE NEEDS AFFORDABLE?
  - ARE NEEDS COMPATIBLE WITH SYSTEM ARCHITECTURE?
    ARE ARCHITECTURES COMPATIBLE WITH NEEDS?
- MISSION ANALYSIS MUST PROVIDE ANSWERS
  - NO OTHER AVAILABLE ALTERNATIVE TO NEW SYSTEM DEVELOPMENT
  - ACQUISITION MAY INCLUDE DOCTRINAL CHANGES OR EXISTING SYSTEMS
- HIGHLIGHTS IMPACT OF DEFICIENCY/OPPORTUNITY

OVERVIEW OF MISSION ANALYSIS

Mission analysis provides a foundation for planning. It provides a rationale for new initiatives by providing answers to overall mission questions and perspective on individual system questions. Mission analysis is key to coupling acquisition and supportability into the PPBS.

PLANNING AND MISSION ANALYSIS

Planning must be built on a sound foundation. Mission analysis provides that foundation, looking both at current and future capabilities. Long-range planning, especially, must consider how both the mission and the current system architecture may evolve. Plans, in turn, must be formulated on the results of the analysis.

JUSTIFICATION FOR MAJOR SYSTEM NEW START (JMSNS)

Those needs to justify a new system, be they deficiencies in mission execution or opportunities to do the mission better, must be systematically viewed from several points of view: priority of the mission vis-à-vis other missions; criticality of need versus other needs in a mission; timing of the need; etc. Requirements from many sources are inputs to the analysis; the synthesis of these requirements and systematic overview will lead to a defined and justifiable set of needs that are affordable within R&D, procurement and O&S accounts for that mission and that can be satisfied by selecting system alternatives that are compatible and supportive of the evolving system architecture for the mission area. When those needs are clearly defined and prioritized within a mission area framework, a JMSNS can be prepared. JCS memorandum SM-7-82 of 11 January 1982 provides policy and procedures establishing and satisfying C^2 needs.

MISSION ANALYSIS ANSWERS

Before a system acquisition involving new development can begin, mission analysis must carefully scrutinize all potential alternatives to initiating development of a new system including changes to strategic or tactical doctrine, use of existing systems, or acquisition of commercially available systems.

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MISSION ANALYSIS - COUPLING OF ACQUISITION/SUPPORTABILITY TO PPBS

- PLANNING AND MISSION ANALYSIS INTERELATED
- MISSION ANALYSIS PRODUCES JMSNS
  - NEEDS BY MISSION AREA
  - REQUIREMENTS VALIDATED
  - ARE NEEDS AFFORDABLE?
  - ARE NEEDS COMPATIBLE WITH SYSTEM ARCHITECTURE?
    ARE ARCHITECTURES COMPATIBLE WITH NEEDS?
- MISSION ANALYSIS MUST PROVIDE ANSWERS
  - NO OTHER AVAILABLE ALTERNATIVE TO NEW SYSTEM DEVELOPMENT
  - ACQUISITION MAY INCLUDE DOCTRINAL CHANGES OR EXISTING SYSTEMS
- HIGHLIGHTS IMPACT OF DEFICIENCY/OPPORTUNITY

DEFICIENCY/OPPORTUNITY IN TERMS OF OPERATIONS OR SUPPORT

Mission analysis will produce justification for new starts from different perspectives. They may be based on:

- deficiency in operational effectiveness
- deficiency in operational suitability
- opportunity to provide needed operational effectiveness at lower cost
- opportunity to provide needed operational suitability at lower cost

There is a need to assess the life cycle supportability of systems in a mission area in establishing the priority of needs.

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ELEMENTS OF MISSION ANALYSIS

- PROJECTION AND ASSESSMENT OF THREAT IN A MISSION AREA
- DEFINITION OF SYSTEM ARCHITECTURE TO COUNTER PROJECTED THREATS IN A MISSION AREA
- DETERMINATION OF OPERATIONAL EFFECTIVENESS OF EXISTING AND PLANNED FORCE STRUCTURE AND PLANNED CAPABILITIES TO ACCOMPLISH MISSION; IDENTIFICATION OF MISSION NEEDS
- DETERMINATION OF OPERATIONAL SUITABILITY OF EXISTING AND PLANNED FORCE STRUCTURE AND PLANNED CAPABILITIES TO ACCOMPLISH MISSION; IDENTIFICATION OF MISSION NEEDS
- REVIEW AND VALIDATION OF REQUIREMENTS
- EXAMINATION OF ALTERNATIVES TO NEW SYSTEM DEVELOPMENT
- DETERMINATION OF MISSION AREA COST-EFFECTIVENESS
- ASSESSMENT OF AFFORDABILITY OF CURRENT AND PROJECTED FORCE STRUCTURE
- ASSESSMENT OF MARKET PLACE FOR POTENTIAL SOLUTIONS TO MEET MISSION NEEDS
- DETERMINATION OF GUIDELINES FOR TAILORING ACQUISITION STRATEGY INCLUDING:
  - AVAILABLE RESOURCES
  - TIMING OF MILESTONE I
  - APPROACH TO CONCEPT EXPLORATION, P^3I, DESIGN COMPETITION, REDUCTION OF SUPPORT RISK, CONSTRAINING COST GROWTH
  - TAILORING FOR UNIQUE PROGRAM ASPECTS

ELEMENTS OF MISSION ANALYSIS

Mission analysis spans what can be seen as a broad spectrum of projection activities associated with developing either a clear statement of the problems or the opportunities that exist or will exist in a mission area,[1] range of solutions to needs consistent with available resources, and guidelines to initiating acquisition programs in that mission. At least ten specific elements of mission analysis exist and are tabulated in the exhibit. These include:

- threat projection and assessment by mission area
- system architecture to counter threat
- needs and requirements for operational effectiveness and operational suitability by mission area
- alternatives, their cost-effectiveness and affordability
- acquisition strategy, including market place assessment.

[1]Note that a mission area structure does exist and is published by USDRE for use in mission area planning and resource allocation (e.g., USDRE Mission Area Summaries and USDRE memo of 26 February 1979, Subject: Research, Development and Acquisition (RD&A) Mission Area Structure).

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C^2 SYSTEM ACQUISITION

- SUMMARY OF SYSTEM ACQUISITION GUIDANCE AND LOGISTICS IMPLICATIONS FOR DCA
- MANAGEMENT CONSIDERATIONS FOR C^2 SYSTEMS ACQUISITION

C^2 SYSTEM ACQUISITION

Specific quidelines for C^2 system acquisition and logistics implications for DCA have been identified; much of the attention is on mission analysis developments. Status, hi-lites and contents of DoDD 5000.1, DoDI 5000.2 and guidance on program documentation have been identified; logistics implications for DCA contained in each have also been identified.

In reviewing DoDI 5000.2 (draft), specific C^2 management considerations were stressed. These include the need for a tailored acquisition strategy incorporating P^3I where appropriate; acquisition process guidance stressing a user/tester/developer/logistician team; and applicability to survivable and enduring major and non-major C^2, counter-C^3, ECM and EW systems. DCA mission analysis must continue to address these aspects of ILS and acquisition planning.

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DEVELOPMENTS IN MISSION ANALYSIS UNDERSTANDING

- GENERAL ACCOUNTING OFFICE
- AT DEFENSE SYSTEMS MANAGEMENT COLLEGE
- OTHER SUPPORTABILITY INITIATIVES

DEVELOPMENTS IN MISSION ANALYSIS UNDERSTANDING

Mission analysis is receiving greater attention as part of stressing enhanced planning on defense matters.

The General Accounting Office (GAO) has recently reorganized to form a Mission Analysis and System Acquisition Division (MASAD). MASAD has several (approximately six) evaluations on-going of current DoD mission analysis activities, three on mission analysis procedures and three on substantive mission areas. Results of these evaluations will be useful in developing mission analysis capabilities. Further, some GAO interest in early logistics analysis ("planning for logistics") has been identified. GAO will be emphasizing cost and affordability of defense missions.

At the Defense Systems Management College, the Director of Research and Information has written to "Logistics Area Mission Analysis" as a key to future acquisition process improvement for incorporating supportability early in the acquisition process.

Other mission analysis developments bearing on supportability are underway. An example are R&D proposals for a government/industry/academia program of research which will address planning for logistics. Significant momentum is building to increase supportability-related R&D which will presumably enhance the quality of supportability-related mission analysis and assessment.

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